

SUPPORT FOR THE AMENDMENTS

Applicants have amended the Claims 1, 16, and 23 for clarity and to delete matrix (a), i.e., to limit these claims to the matrices of Claims 5-8, and to re-label old matrix (b) as (a).

Support for amended Claims 1, 16, and 23 can be found in the same claims, as previously presented. Claims 8, 13, 15, 20, 22, 24, 26, 30, and 34 have been amended for clarity and properly depend from amended Claims 1, 16, and 23. Support for amended Claims 8, 13, 15, 20, 22, 24, 26, 30, and 34 can be found in the same claims, as previously presented.

Applicants have also added new Claims 35-37. Support for new Claims 35-37 can be found on page 18, line 16, to page 19, line 4, of the specification.

No new matter has been added. Claims 1-4, 8, 13-26, 30, and 34-37 are active in this application.

REMARKS/ARGUMENTS

At the outset, Applicants' representative wishes to thank Examiner Paden for the helpful and courteous discussion held on April 17, 2008, during which the prosecution of the above-identified application was materially advanced. The following remarks will expand and summarize the issues discussed.

Present Claims 1-4, 8, 13-15, and 35 relate to encapsulation compositions, comprising:

(C) an encapsulate, encapsulated in:

(D) a glassy matrix,

wherein said glassy matrix is:

(a) a composition, comprising:

(a₁) 5 to 95 % by weight, based on the total weight of said composition (a), of a first food polymer;

(a₂) 5 to 90 % by weight, based on the total weight of said composition (a), of a second food polymer; and

(a₃) 0 to 45 % by weight, based on the total weight of said composition (a), of a component selected from the group consisting of a sugar, a polyol, a corn syrup solid, and mixtures thereof,

wherein said first food polymer is an n-octenylsuccinic anhydride-modified starch, and

wherein said second food polymer is selected from the group consisting of an exudate gum, a bacterial gum, an extract gum, a seed gum, a pectin, a pregelatinized starch, agar agar, a hydrogenated starch hydrolyzate, a modified cellulose, a seaweed hydrocolloid extract, a protein, a fractionated protein, a hydrolyzed protein, and chitosan.

Present Claims 23-26, 34, and 37 relate to processes for preparing such a composition, and Claims 16-22, 30, and 36 relate to compositions prepared by such a process.

The present inventors have discovered that the presently claimed compositions are particularly effective for the encapsulation of materials. The cited references neither disclose nor suggest the presently claimed compositions or processes. Accordingly, these references cannot affect the patentability of the present claims.

The rejection of Claims 1-8 and 13-34 under 35 U.S.C. § 103(a) in view of U.S. Patent Nos. 5,897,897 (Porzio et al. '897) or 5,603,971 (Porzio et al. '971) has been, in part, obviated by amendment and is, in part, is respectfully traversed. First, as explained above, the claims have been amended to delete old matrix (a).

As for the rejection of old matrix (b), renamed as new matrix (a), since Porzio et al. '897 and Porzio et al. '971 are related and have substantially the same disclosure, the rejection will be discussed in terms of Porzio et al. '971.

As noted above, the matrix (a) comprises a first food polymer, which is an n-octenylsuccinic anhydride-modified starch, and a second food polymer, which is selected from the group consisting of exudate gums, bacterial gums, extract gums, seed gums, pectins, dextrins, pregelatinized starches, agar agar, polydextrose, hydrogenated starch hydrolyzates, modified celluloses, seaweed hydrocolloid extracts, proteins, fractionated proteins, hydrolyzed proteins, and chitosan. Thus, matrix (a) contains a mixture of an n-octenylsuccinic anhydride-modified starch and a food polymer which has a high molecular weight.

In this regard, the only matrices disclosed in Porzio et al. '971 which contain an n-octenylsuccinic anhydride-modified starch are matrices (f) and (g):

(f) 30 to 100 wt. % of a modified starch (e.g. sodium octenyl succinate modified starch), and 0 to 70 wt. % of a mono- or disaccharide; and

(g) 85 to 100 wt. % of a modified starch (e.g. sodium octenyl succinate modified starch), and 0 to 15 wt. % of a polyhydric alcohol.

See, col. 4, lines 34-39.

Porzio et al. '971 defines the mono- or disaccharide of matrix (f) as follows:

Suitable mono- and disaccharides include, e.g., glucose, sucrose, lactose, fructose, and maltose. Preferred are glucose, sucrose, and maltose.

See, col. 14, lines 23-26.

Porzio et al. '971 defines the polyhydric alcohol of matrix (g) as follows:

Suitable polyhydric alcohols include propylene glycol and glycerin.

See, col. 14, lines 35-36.

In this regard, it is well known in the art that the mono- and disaccharides or matrix (f) and the polyhydric alcohols of matrix (g) of Porzio et al. '971 have fairly low molecular weights. Specifically, glucose, sucrose, lactose, fructose, and maltose have molecular weights of 180, 342, 342, 180, and 342, respectively (*see*, the entries for glucose, sucrose, lactose, fructose, and maltose in the excerpt from The Merck Index, 9th Ed., Merck & Co.,

Inc., Rahway, NJ, 1976, attached hereto as Exhibit A). Similarly, propylene glycol and glycerin have molecular weights of 76 and 92, respectively, (see, the entries for propylene glycol and glycerin in Exhibit A)

Thus, Porzio et al. '971 only discloses the combination of an n-octenylsuccinic anhydride-modified starch with low-molecular weight components

In sharp contrast, the present claims recite that the matrix contains both an n-octenylsuccinic anhydride-modified starch and a second food polymer which is selected from the group consisting of exudate gums, bacterial gums, extract gums, seed gums, pectins, dextrins, pregelatinized starches, agar agar, polydextrose, hydrogenated starch hydrolyzates, modified celluloses, seaweed hydrocolloid extracts, proteins, fractionated proteins, hydrolyzed proteins, and chitosan. As the Examinier will recognize, the second food polymers recited in the present claims have molecular weights which are much higher than the mono- and disaccharides or matrix (f) and the polyhydric alcohols of matrix (g) of Porzio et al. '971.

In addition, dependent Claims 35-37 require that the second food polymer be selected from the group consisting of gum arabic, gum karaya, gum tragacanth, konjac, larch gum, locust bean gum, guar gum, xanthan gum, sodium carboxymethyl cellulose, agar agar, type A gelatin, type B gelatin, and mixtures thereof, all of which have much higher molecular weights than the mono- and disaccharides or matrix (f) and the polyhydric alcohols of matrix (g) of Porzio et al. '971. In support of this assertion, the molecular weights of the second food polymers of Claims 35-37 are shown in the following table.

<u>Food Polymers</u>	<u>Molecular Weight</u>	<u>Reference</u>
Gum arabic	250,000 -1,000,000	Glicksman, p. 99
Gum karaya	300,000-1,000,000	Hoefler, p.14
Gum tragacanth	840,000	Phillips, p.233

Pectin	110,000-150,000	Hoefler, p..19
Carrageenan	100,000-1,000,000	Hoefler, p..16
Konjac	200,000-2,000,000	Hoefler, p..11
Larch gum	100,000	Harbourne
Locust bean gum	400,000-1,000,000	Hoefler, p..9
Guar gum	150,000-1,500,000	Hoefler, p..8
Tara gum	300,000-1,000,000	Hoefler, p..10
Xanthan gum	~ 3,000,000	Hoefler, p..21
Carboxymethyl cellulose (CMC)	90,000-700,000	Whistler, p..161
Agar, two fractions: agarobiose agarpectin	100,000-150,000 14,000-20,000	Phillips, p.27 Phillips, p.28
Gelatin, type A	80,000- 375,000	Glicksman, p. 363
Gelatin, type B	80,000- 375,000	Glicksman, p. 363

References/Sources

Glicksman, R. "Gum Technology in the Food Industry" Academic Press (1969).

Harborne, J. B. and Baxter, H. "Chemical Dictionary of Economic Plants, John Wiley & Sons (2001).

Hoefler, A. C., "Hydrocolloids", A.C.Hoefler, Ed., Eagan Press, St. Paul, Minnesota (2004).

Jiang, J. et al., Int. J. Polymeric Materials, vol. 56, pp. 1145-1154 (2007).

Keary, C. M., Carbohydrate Polymers, vol. 45, pp. 293-303 (2001).

Phillips, G. O., in "Handbook of Hydrocolloids," G. O. Phillips and P. A. Williams, Eds., CRC Press, Boca Raton, 2000.

Whistler, R. L , in "Carbohydrate Chemistry for Food Scientists", R.L.Whistler and J.N.BeMiller, Eds. Eagan Press, St. Paul, Minnesota, 1997.

Nowhere in Porzio et al. '971 is there any disclosure which would suggest a combination of an n-octenylsuccinic anhydride-modified starch with a high-molecular weight second food polymer.

Accordingly, the rejection should be withdrawn.

Applicants submit that the present application is now in condition for allowance, and early notification of such action is earnestly solicited.

Respectfully submitted,

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